

as now amended. Thus, "dynamic" means just what it says, both by definition and particularly in the context of the claim. If there was any doubt in this regard, it should be removed by the foregoing amendments to related portions of the claim - i.e., as now set forth in Claims 1, 9, and 19, it functions during relative rotation between it and the part with which it seals so as "to accomodate rotation of the hubcap in relation to the axle".

The foregoing amendments have been made in the interest of further clarifying the important feature of the present invention, as compared with the '979 patent, wherein the opening adjacent to the one dynamic seal is of sufficient length so that misalignment between first and second members is compensated for by flexure of the flexible tube, rather than distortion of the dynamic seal.

The Examiner's rejection of the claims as being "anticipated" by Naedler '979 (presumably Fig. 4 thereof) is believed to ignore clearly claimed structural differences between the two.

Of course, there is some relativity in any term such as "flexible" and "rigid", and for that matter, the term "elongate", as compared with the "short" lengths of the openings in '979. Hence, one must look at the context in which they are used, and the purpose of their use. Thus, Applicant's invention combines the features of a flexible tube extending closely within an elongate opening, the purpose being to accommodate misalignment as noted above, and thereby minimize deformation of the seals which might otherwise result in their fatigue, as may occur in '979 and similar prior art wherein the tube is rigid, and extends loosely through an opening so short as to permit of the tube to engage the seals at both

of its ends. Thus, the two terms "rigid", "closely", and "elongate" differ in principal from the terms "rigid", "closely", and "short".

The claims further point out this difference by stating that the flexibility of the tube compensates for misalignment while minimizing risk of distortion of the seal rings which might enable them to leak. Thus, it is the purpose of the design in the '979 patent to rely on deformation of the seal to compensate for misalignment. As a matter of fact, in the '979 patent, the tube must be rigid because a flexible tube would bend in the middle since the "pivot points" could not restrain it from collapsing under pressure from each end.

The purpose (and thus the teaching) of the '979 patent, particularly in comparison to the present invention, is in fact that is set forth in the "object" beginning at the bottom of column 1 and continuing at the top of column 2, namely:

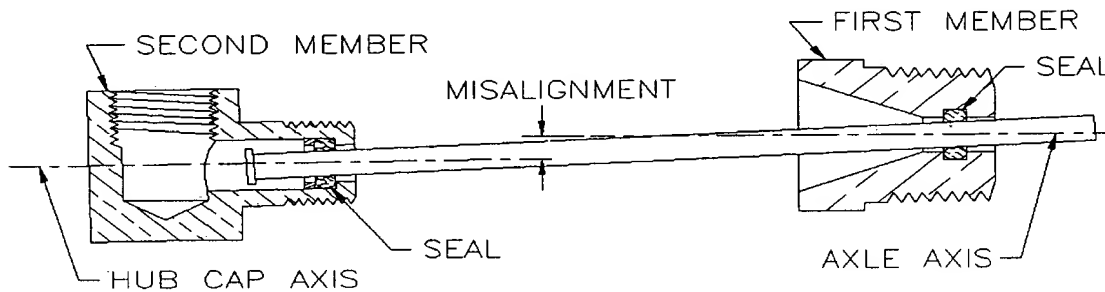
"A further object of the present invention is including a sealing connection between the first end of the tubular member and the hubcap allowing movement between the first end of the tubular member and the cap for compensating for misalignment between the rotatable cap and the stationery part of the union."

which obviously teaches away from flexibility. If there was any doubt in this regard, the last few lines in Claim 1 require:

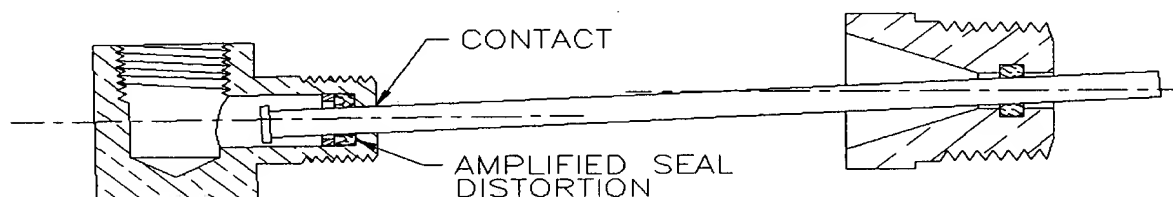
".....the ends of the hollow member are free to pivot in the resilient seals and compensate for any misalignment".

To illustrate these different principals, Applicant has prepared the following drawings labeled Figs. 1, 2, 3, and 4, wherein:

Fig. 1 illustrates the result of misalignment of the rigid tube in the '979 patent, wherein the seals are distorted by the ends of the tube which extend relatively loosely through openings of short length. It will be understood, of course, that to enable this seal to compensate for misalignment, the openings must be short and fit loosely about the tube.



If, on the other hand, either or both openings in the first and second union members of the '979 closely received the tube, there would be contact between the rigid tube and edge of the opening, as illustrated in Fig. 2. That is, the seal ring would yield further to the rigid tube as it pivoted about its contact point at the opening. This would amplify seal distortion and shortly cause its failure.



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Fig. 3 below illustrates what would occur if a rigid tube extended closely through elongate openings. That is, such a tube would not be free to compensate for misalignment, as is possible with a flexible tube as in the present application, and could cause actual breakage of the tube adjacent the ends of the openings. This is apparently the reason the '979 patent specifically states that movement between the tubular member and seals compensates for misalignment, but not flexure of the rigid tube.

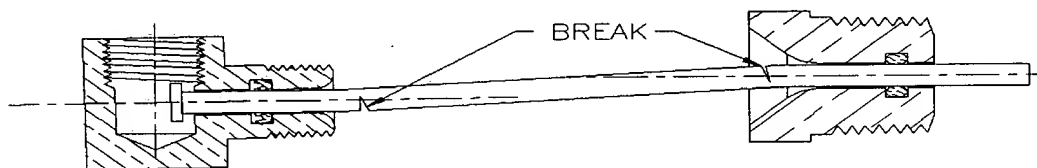
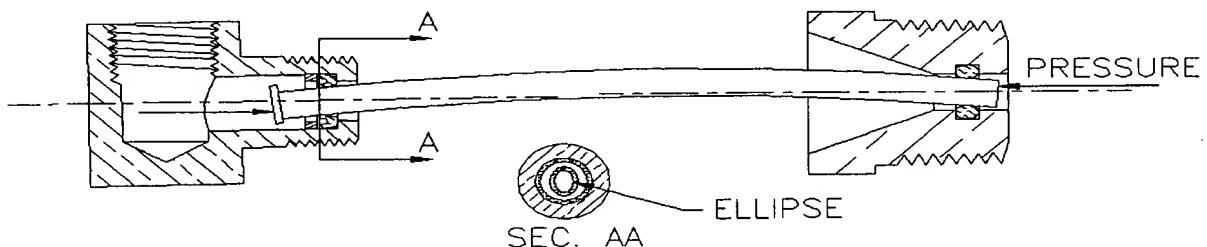


Fig. 4 below also illustrates another possible problem in the use in '979 of a flexible tube which might have to pivot between seals upon misalignment. This would result in an arch-shaped tube inasmuch as air pressure is applied to both ends causing them to buckle toward the center. This is even more harmful to the effectiveness of the seals. Thus, this added deformation may cause immediate leakage failure, and will certainly shorten the seal's life.




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Thus, Applicant's invention, wherein the flexible tube is sealed and closely received within an elongate openings at both ends, relies on flexure in the tube, rather than wear on the seals, to accommodate for misalignment. These two opposed phenomenon point up the intended improvements of the present application. Thus, in '979, the tube must be rigid and the openings must be large enough to loosely receive their ends and allow the tube to pivot freely within the seals, while in the present invention, the tube must be flexible and extend closely through elongate openings. The purpose and intent of '979 are, as noted above, clearly expressed in the claims.

In view of the forgoing, it is believed that the present application is entitled to allowance, and such action is earnestly solicited.

Respectfully submitted,



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